Foundation of the caddisfly (Trichoptera) fauna of the Visegrádi Mountains

By

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Abstract. More than 5500 specimens of 59 species were collected from 14 sites in the study area. Distribution, abundance and phenological data of some interesting species are published.

The Trichoptera fauna of the lower areas of the Carpathian Basin is only incompletely known. Trichoptera collections of Hungarian museums contain only some species. Trichopterological surveys of some areas as a result of data of regular collections were also done incompletely. The first trichopterological study was carried out in the Zemplén Mountains (OLÁH, 1964) and the Mátra (KISS, 1979, 1987). Recently a more detailed faunistical study of Southern and Western Hungary was carried out (NÓGRÁDI and UHERKOVICH, 1985, 1988, 1989; ANDRIKOVICS and UJHELYI, 1983).

These studies are the continuation of the previous extensive examinations carried out thoroughout the country (UJHELYI, 1971, 1974, 1981, 1982, 1985; OLÁH, 1964, 1967), which found some new species and a new subspecies, determined the flying periods of the Hungarian caddisfly species and can reveal the pollution in streams and rivers. As a continuation of these studies from 1984 we collected trichopteras regularly along three typical streams in the Visegrádi Mountains. Results of the identification of the collected some thousand specimens and their biogeographical and ecological consequences are given.

The presence of only some species in this area are published in the old and the current trichopterological literature (PONGRÁCZ, 1914; UJHELYI, 1971, 1981, 1982).

Geographical and ecological description of the study area

The Visegrádi Mountains, which is situated at the north—eastern end of the Dunántúli Mountains, is separated from the Budai Mountains and Gerecse Mountains by the Dorog—Pilisvörövári Pass of north—western south—eastern direction. The mountains have two geologically different parts. The Pilis consists of mainly Triassic limestone and dolomite. Peaks and summits rose to different heights due to the tectogenesis. The Pilis summit with its 757 m height is the highest point in the Dunántúli Mountains. Valleys and slopes are covered with thick Pleistocene rock layers. Pilis is

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bordered by the Visegrádi Mountains of volcanic origin in the north. The border between the two parts can be determined along the Kétbükkfa Col and the Szentléleki Stream. The Visegrádi Mountains can be regarded as the structural continuation of the Börzsöny from which it is spearated by the Danube. The mountains consists of mainly andesite and pyroclastic rocks. Its highest peak is the 700 m high Dobogókő. The original forms of the mountains can be hardly recognised after the ceasing of the volcanic activity. The tectogenesis during the Mesozoic and Tertiary periods broke the mountains into pieces.



Fig. 1. Schematic map of the examined area with the collecting sites. Key to the signs used: a=built-up areas, b=foresta, c=roads, d=collecting sites. Explanation of localities: 1=Dömös, 2=Esztergom, 3=Leányfalu, 4=Piliscsaba, 5=Pilismarót, 6=Pilisszentkereszt, Kétbükk-nyereg, 7=Pilisszentkereszt, Dobogókő, 8=Szentendre, 9=Szentendre, Dömörkapu, 10=Tahi, 11=Visegrád

Watercourses belong to the catchment area of the Danube. As the two mountains are different, their permeability is also different. In the Pilis consisting of karstic roks precipitation oozes into the dept. Water is carried by only two streams, the Szentléleki (János) and the Kovácsi (Dera) Streams. On the other hand the volcanic rocks constituting the Visegrádi Mountains are usually impermeable, so there are more superficial watercourses there. However due to the small extension and the medium height only shorter and smaller streams are present.

The upper steep parts of the streams are usually rocky. There are pass-like valleys and waterfalls in some places. Our studies were carried out along four unchaching streams (Bükkös, Apátkúti, Pilismaróti and Malom Streams) in the Visegrádi Mountains (Fig. 1). The next table shows the length and catchment area of the streams involved in the studies.

	Length	Catchment area
Pilismaróti (Malom) Stream	11.7 km	26.2 km^2
Dömösi (Malom) Stream	5.9 km	14.2 km^2
Apátkúti Stream	9.2 km	19.1 km^2
Bükkös Stream	17.8 km	39.2 km^2

The four streams all run into the Danube (Fig. 1). Their gradient graphs are shown in Figures 2—5. The speed of the streams vary between 0.095 and 3.8 m/s and the speed is the function of not the average but the immediate slope. There are some hydrological establishments along the Bükkös and Apátkúti Streams. The bed of the Apátkúti Stream is blocked by a dike near Pilisszentlászló and a large water-basin is formed to avoid floods. A weir is built for anglers near to this place under the Ördögmalom Waterfall. The mountainous parts of the four streams are in the Pilis Biosphere Reserve.

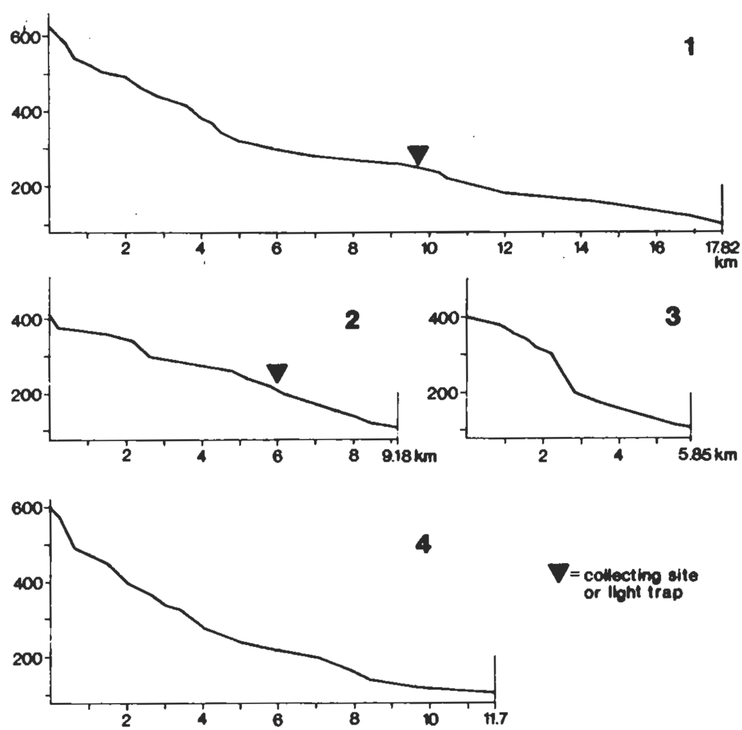


Fig. 2. Gradien graph of four most important streams of the examined area. 1=Szentendre, Bükkös Stream, 2=Visegrád, Apátkúti Stream, 3=Dömös, Malom Stream, 4=Pilismarót, Malom Stream

Study areas and methods

The topography of the four streams are shown in Figure 1. The farest stream from Budapest is the Pilismaróti (Malom) Stream which has its triple source south of Pilisszentlélek and after taking 12 km and flowing through Pilismarót it runs into the Danube. Along this stream at Hamvaskő the Zoological Department of the Natural History Museum, Budapest operated a light trap from 1984 to 1986, the collected trichopteras were identified by the authors. The Department of Systematic Zoology and Ecology of Eötvös University also operated light traps along the Apátkúti and Bükkös Streams. The Apátkúti light trap was operating and the hunting cottage while the one along the Bükkös Stream at the waterfall series at Dömörkapu.

We used 125 W HgL light traps (JERMY's funnel-like light trap) thoroughout the nights and walked all over the streams. Only some collections were carried out during the day along the Dömösi Malom Stream, thus we used the data only from the three other streams for detailed quantitative comparisons.

The Apátkúti Stream has its source at Pilisszentlászló and breaks through the Szentlászló and Apátkúti Valleys. It runs into the Danube at Visegrád. The Bükkös Stream is the longest from the examined streams. It has its source at Dobogókő 600 m above sea-level and after taking 16.5 km it runs into the Danube at Szentendre.

The examined streams are affected by human activity, the effects can be divided into two main types. Artifical objects in the bed change its characteristics, however their effect on the fauna can be hardly studied as we do not know the fauna before the control. On the other hand effects of pollution can be easily recognized mainly along the Bükkös Stream. Dirty water at human habitats decreases the fauna. Moreover the Bükkös Stream is loaded by industrial pollution and due to this effect the stream which once had a very rich fauna now runs into the Danube as a drain-pipe.

List of the material

In this chapter all species are listed with their localities and dates, and the quantity of males and females. The system and nomenclature is that of BOTOSANEANU and MALICKY, 1978. The used abbreviations: A=leg. S. ANDRIKOVICS, lt=light trap.

Rhyacophilidae

Rhyacophila fasciata HAGEN, 1859 — Dömös, Szentendre (UJHELYI, 1981); Pilismarót, 1983, Sept 4, 1 ♂, 1984, May 19, 1 ♀, May 28, 1 ♂, May 30, 1 ♂, June 3, 1 ♂, June 17, 1 ♂, Sept 18, 1 ♂, Oct. 3, 1 ♀ (l); Szentendre, Dömörkapu, 1986, May 13—14, 2 ♂, May 21—22, 16 ♂, 4 ♀, May 27—28, 24 ♂, 2 ♀, June 4—5,36 ♂, 2 ♀, June 16—17,20 ♂, June 19—20,14 ♂, July 29—30,6 ♂, 2 ♀, Aug. 14—15, 4 ♀, Sept. 29—30,5 ♂, Oct. 7—8,1 ♂, 1987, June 2—3, 2 ♂, June 5—6, 1 ♂, 1 ♀, June 6—7, 1 ♂, 2 ♀, June 15—16, 1 ♂, 2 ♀, July 15—16, 1 ♂, 3 ♀; Visegrád, 1984, May 25, 1 ♀, June 12, 2 ♂, July 12—13, 7 ♂, July 16—17, 3 ♂, Sept. 4—5, 3 ♂, 3 ♀, Sept. 5—6, ♂, Oct. 9—10, 8 ♂, 22 ♀, Oct. 18—19, 3 ♂, 1 ♀, Oct. 30, 4 ♂, 1985, June 1—7, 36 ♂, 2 ♀, June 9—14,4 ♂, Aug. 21—22, 15 ♂, Sept. 28—29, 6 ♂ (A).

Rhyacophila tristis PICTET, 1834 — Dömös, Szentendre (UJHELYI, 1981); Szentendre, Dömörkapu, 1986, May 21—22,4 ♂, June 4—5, 2 ♂, July 7—8, 1 ♀ (A)

Glossosomatidae

Synagapetus mosely ULMER, 1938 — Pilismarót, 1984, May 30, 2 ♂, June 1, 2 ♂, June 1, 2 ♂, June 3, 6 ♂, June 5, 2 ♂, June 7, 3 ♂, June 11, 3 ♂, June 13, 3 ♂, June 14, 1 ♂, June 17, 1 ♂, June 18, 1 ♂, June 20, 1 ♂, June 21, 1 ♂, June 27, 1 ♂, 1 ♀, June 30, 1 ♂, July 1, 2 ♂, July 6, 1 ♂, July 8, 1 ♂, July 16, 1 ♂, July 18, 2 ♂, July 20, 1 ♂, July 26, 1 ♂, 1986, June 5—6, 6 ♂, June 9—10, 1 ♂, 1 ♀, June 24, 2 ♂, June 28, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 21—22, 3 ♂, May 27—28, 18 ♂, 5 ♀, June 4—5, 10 ♂, June 16—17, 6 ♂, 4 ♀, June 19—20, 1 ♀, July 7—8, 7 ♂, 11 ♀, 1987, June 15—16, 7 ♂ (A); Visegrád, 1984, June 12, 14 ♂, June 1—7, 60 ♂, 3 ♀ (A).

Agapetus delicatulus MCLACHLAN, 1884 — Szentendre, Dömörkapu, 1986, June 16—17, 1 ♀, July 7—8, 4 ♀ (A).

Philopotamidae

Philopotamus montanus DONOVAN, 1813 — Szentendre, Dömörkapu, 1986, May 21—22, 1 ♀, June 16—17, 1 ♂, June 19—20, 1 ♂, Sept. 21—22, 3 ♂, 1987, June 15—16, 1 ♂, 1 ♀ (A); Visegrád, 1985, June 1—7, 1 ♂ (A).

Philopotamus variegatus SCOPOLI, 1763 — Szentendre, Dömörkapu, 1986, May 21—22, 3 ♂, May 27—28, 6 ♂, June 45, 1 ♀, June 16—17, 2 ♂, 1 ♀, June 19—20, 1 ♂, Sept. 21—22, 3 ♂, 1987, June 6—7, 1 ♂ (A); Visegrád, 1985, June 1—7, 4 ♂, 2 ♀ (A).

Hydropsychidae

Hydropsyche bulbifera MCLACHLAN, 1878 — Szentendre (UJHELYI, 1982); Dömös, 1926, Sept. 12, 1 ♂, 1927, June 5, 3 ♂ (leg. REMETEY); Pilismarót, 1984, July 11, 2 ♂, July 12, 4 ♂, July 14, 1 ♂, 1986, June 28, 1 ♂ (lt); Szentendre 1958, July 7 (leg. SZŐCS J.).

Hydropsyche bulgaromanorum MALICKY, 1977 — Szentendre (UJHELYI, 1982); Dömös, 1927, July 11, 1 ♂ (leg. REMETEY); Tahi, 1960, Aug. 2, 3 ♂ (leg. BENEDEK); Visegrád, 1984, May 17, 1 ♂, July 12—13, 1 ♂ (A).

Hydropsyche contubernalis MCLACHLAN, 1865 — Pilisszentkereszt—Dobogókő; Szentendre (UJHELYI, 1982); Piliscsaba 1983, Aug. 23, 3 ♂ (leg. SZABÓKY); Pilismarót, 1983, Sept. 2—21, 32 ♂, 1984, May 27—Sept. 16, 107 ♂, 1986, June 9—Aug. 29, 129 ♂ (lt); Tahi, 1960, Aug. 2, 6 ♂ (leg. BENEDEK); Szentendre, Dömörkapu, 1986, May 27—28, 7 ♂, June 4—5, 1 ♂, June 16—17, 38 ♂, July 29—30, 35 ♂, Aug. 14—15, 19 ♂, Aug. 21—22, 1 ♂, Sept. 21—22, 16 ♂, Oct. 7—8, 1 ♂, 1987, June 15—16, 48 ♂, July 15—16, 18 ♂ (A); Visegrád, 1984, April 4, 1 ♂, May 17, 2 ♂, May 25, 3 ♂, May 30, 1 ♂, July 12—13, 11 ♂, July 16—17, 19 ♂, Sept. 4—5, 14 ♂, Sept. 5—6, 1 ♂, 1985, June 1—7, 65 ♂, Aug. 14—15, 13 ♂, Aug. 20—21, 3 ♂, Aug. 21—22, 2 ♂, Sept. 28—29, 31 ♂ (A).

Hydropsyche fulvipes CURTIS, 1834 — Dömös (UJHELYI, 1982); Pilismarót, 1984, Aug. 7, 2 ♂ (lt); Szentendre, Dömörkapu, 1986, June 16—17, 1 ♂, June 19—20, 3 ♂ (A); Visegrád, 1984 May 7, 1 ♂, July 12—13, 2 ♂, July 16—17, 1 ♂, Aug. 6—7, 1 ♂, 1985, June 1—7, 9 ♂, Aug. 20—21, 1 ♂ (A).

Hydropsyche instabilis CURTIS, 1834 —Pilismarót, 1983, Sept. 3, 2 ♂, Sept. 4, 1 ♂, Sept. 5, 1 ♂, Sept. 16, 1 ♂, 1984, July 11, 3 ♂, July 12, 1 ♂, July 15, 1 ♂, July 16, 1 ♂, Aug. 7, 1 ♂, Aug. 23, 1 ♂, Aug. 30, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, June 16—17, 13 ♂, June 19—20, 4 ♂, July 7—8, 59 ♂, July 29—30, 67 ♂, Aug. 14—15, 13 ♂, Aug. 21—22, 8 ♂, Sept. 21—22, 1 ♂, 1987, June 15—16, 3 ♂, July 15—16, 47 ♂ (A); Visegrád, 1984, July 12—13, 8 ♂, July 16—17, 7 ♂, Aug. 6—7, 13 ♂, Sept. 4—5, 7 ♂, 1ǿóß, June 1—7, 1 ♂, June 9—14, 1 ♂, Aug. 14—15, 6 ♂, Aug. 20—21, 8 ♂, Aug. 21—22, 6 ♂, Sept. 28—29, 3 ♂ (A).

Hydropsyche pellucidula CURTIS, 1834 — Pilismarót, 1984, July 12, 1 ♂, 1986, July 23, 1 ♂ (lt).

Hydropsyche saxonica MCLACHLAN, 1884 — Dömös, 1928, July 1, 1 ♂ (leg. REMETEY); Pilismarót, 1984, Sept. 18, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 13—14, 1 ♂, May 21—22, 43 ♂, May 27—28, 17 ♂, June 16—17, 7 ♂, June 19—20, 4 ♂, July 7—8, 1 ♂, July 29—30, 1 ♂, Aug. 14—15, 1 ♂, Sept. 21—22, 8 ♂, 1987, June 2—3, 6 ♂, June 5—6, 7 ♂, June 6—7, 3 ♂, June 15—16, 21 ♂, July 15—16, 22 ♂ (A); Visegrád, 1984, Aug. 6—7, 1 ♂, 1985, June 1—7, 46 ♂, Aug. 14—15, 2 ♂ (A).

Hydropsyche females (undeterminated) — Piliscsaba, 1 ♀ (leg. SZABÓKY); Pilismarót, 271 ♀ (lt); Szentendre, Dömörkapu, 939 ♀ (A); Visegrád, 393 ♀ (A).

Cheumatopsyche lepida PICTET, 1834 — Dömös, 1928, June 22, 1 ♂ (leg. REMETEY).

Polycentropodidae

Neureclipsis bimaculata LINNAEUS, 1758 — Pilismarót, 1984, July 14, 1 ♀ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 1 ♂ (A).

Plectrocnemia brevis MCLACHLAN, 1871 — Pilismarót, 1983, Sept. 5, 1 ♂, Sept. 6, 2 ♂, Sept. 16, 1 ♂, Sept. 21, 2 ♂, 1984, May 15, 1 ♂, May 16, 1 ♂, May 17, 2 ♂, 1 ♀, May 18, 2 ♂, 1 ♀, May 21, 1 ♂, May 22, 1 ♀, May 25, 2 ♂, May 28, 3 ♂, 1 ♀, May 31, 1 ♂, June 1, 2 ♂, June 3, 2 ♂, June 7, 2 ♂, June 11, 4 ♂, June 14, 1 ♂, June 21, 2 ♂, June 27, 3 ♂, June 30, 1 ♂, July 1, 1 ♂, July 6,1 ♂, July 11, 1 ♂, July 16, 2 ♂, Sept. 18, 1 ♂, Sept. 20, 1 ♂, 1 ♀, Sept. 25, 2 ♂, Sept. 29, 1 ♂, Sept. 30, 1 ♂, Oct. 11, 1 ♂, Oct. 18, 1 ♂, 1986, May 20,1 ♂ (lt); Visegrád, 1985, June 1—7, 1 ♂ (A).

Plectrocnemia conspersa CURTIS, 1834 — Dömös, 1927, June 5, 1 ♂ (leg. REMETEY); Pilismarót, 1983, Sept. 3, 1 ♂, Sept. 5,1 ♂, 1984, May 15, 1 ♂, May 30, 1 ♂, June 2, 20 ♂, 1 ♀, June 3, 2 ♂, 1 ♀, June 5, 1 ♂, June 7, 1 ♂, June 9, 1 ♂, June 13, 1 ♂, June 21, 1 ♀, June 27, 3 ♂, July 16, 1 ♂, July 19, 1 ♂, Aug. 16, 1 ♂, Aug. 18, 1 ♂, Sept. 16, 2 ♂, Sept. 18, 1 ♂, 1 ♀, Sept. 20, 1 ♀, Oct. 5, 1 ♂, 1986, June 5—6, 2 ♂, June 9—10, 1 ♂ (lt); Szentendre. Dömörkapu, 1986, May 27—28, 2 ♂, June 9—10, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 27—28, 2 ♂, 1 ♀, June 16—17, 6 ♂, June 19—20, 4 ♂, July 7—8, 3 ♂, July 29—30, 4 ♂, Aug. 14—15, 5 ♂, 1 ♀, Aug. 21—22, 1 ♀, Sept. 21—22, 1 ♀, Sept. 29—30, 1 ♂, 1987, June 15—16, 3 ♂, July 15—16, 1 ♂ (A); Visegrád, 1984, June 12, 2 ♂, 1985, Aug. 21—22, 1 ♂ (A).

Polycentropus flavomaculatus PICTET, 1834 — Dömös, 1927, June 5, 1 ♂, 1 ♀, 1928, July 1, 2 ♂, 1 ♀ (leg. REMETEY); Szentendre, Dömörkapu, 1986, May 21—22, 4 ♂, May 27—28,4 ♂, 1wJune 4—5, 1 ♀, June 16—17, 7 ♂, June 19—20, 2 ♂, 1987, June 15—16, 2 ♂ (A); Visegrád, 1984, Sept. 4—5, 1 ♂, 1985, June 1—7, 13 ♂, 3 ♀, Aug. 21—22, 1 ♂ (A).

Cyrnus trimaculatus CURTIS, 1834 — Pilismarót, 1984, June 3, 1 ♀, June 21, 1 ♂, June 27, 1 ♂, July 12, 1 ♂, July 14, 1 ♀, Aug. 7, 1 ♀, 1986, July 8, 1 ♀ (lt).

Psychomyidae

Lype reducta STEPHENS, 1836 — Visegrád, 1984, July 12—13, 1 ♂, Aug. 12—13, 1 ♂, 1985, June 1—7, 1 ♂ (A).

Tinodes rostocki MCLACHLAN, 1878 — Pilismarót, 1984, Aug. 8, 1 ♀ (lt); Szentendre, Dömörkapu, 1986, May 21—22, 14 ♂, 2 ♀, June 16—17, 12 ♂, June 19—20, 1 ♂, Sept. 21—22, 3 ♂, 1 ♀, 1987, June 15—16, 11 ♂, 8 ♀ (A); Visegrád, 1985, June 1—7, 12 ♂ (A).

Ecnomidae

Ecnomus tenellus RAMBUR, 1842 — Szentendre, Dömörkapu, 1986, Sept. 21—22, 1 ♂, 1987, June 15—16, 3 ♂, 3 ♀ (A); Visegrád, 1984, July 12—13, 9 ♂, 76 ♀, Sept. 4—5, 1 ♀, 1985, June 1—7, 1 ♂ (A).

Phryganeidae

Phryganea grandis LINNAEUS, 1758 — Esztergom, 1961, July 22, 1 ♀ (leg. BLATTNY).

Limnephilidae

Ironoquia dubia STEPHENS, 1837 — Pilismarót, 1983, Sept. 20, 1 ♀ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 1 ♂ (A); Visegrád, 1985, Sept. 28—29, 1 ♀ (A).

Ecclisopteryx madida MCLACHLAN, 1867 — Pilismarót, 1984, Sept. 18, 1 ♀ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 12 ♂, 9 ♀, Sept. 29—30, 1 ♀, Oct. 7—8, 1 ♂, 2 ♀, Oct. 28, 1 ♂ (A); Visegrád, 1984, Oct. 9—10, 1 ♂, Oct. 18—19, 1 ♂ (A).

Limnephilus affinis CURTIS, 1834 — Piliscsaba, 1986, May 6, 1 ♀ (leg. SZABÓKY); Pilismarót, 1983, Sept. 3, 1 ♂, Sept. 21, 1 ♀, Sept. 24, 1 ♀, Sept. 30, 1 ♀, Oct. 4, 1 ♀, Oct. 8, 1 ♀, Oct. 10, 1 ♀, Oct. 26, 1 ♀, 1984, May 22, 1 ♀, Sept. 20, 3 ♀, Sept. 21, 1 ♀, Sept. 22, 1 ♀, Sept. 30, 1 ♂, 1 ♀, Oct. 3, 4 ♀, Oct. 5, 2 ♀ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 2 ♂, 2 ♀ (A); Pilisszentkereszt, Dobogókő, 1971, May 18 (leg. K. SIN).

Limnephilus auricula CURTIS, 1834 — Pilismarót, 1983, Sept. 3, 1 ♂, Sept. 4, 1 ♂, Sept. 5, 1 ♂, Sept. 6, 2 ♂, Sept. 9, 6 ♂, Sept. 13, 1 ♀, Sept. 14, 1 ♂, Sept. 15, 1 ♀, Sept. 16, 4 ♂, 1 ♀, Sept. 17, 4 ♂, 2 ♀, Sept. 21, 1 ♂, 3 ♀, Sept. 24, 1 ♂, Sept. 26, 1 ♂, Oct. 2, 2 ♂, Oct. 3, 3 ♂, 2 ♀, Oct. 5, 1 ♂, Oct. 7, 1 ♀, Oct. 8, 2 ♂, Oct. 9, 6 ♂, Oct. 11, 2 ♂, Oct. 12, 1 ♂, 1 ♀, Oct. 15, 4 ♂, Oct. 16, 10 ♂, 3 ♀, Oct. 17, 2 ♂, Oct. 18, 3 ♂, Oct. 19, 4 ♂, Oct. 26, 3 ♂, 1984, May 23, 1 ♂, May 27, 1 ♂, May 29, 2 ♂, 1 ♀, May 30, 1 ♂, 1 ♀, June 13, 1 ♀, Sept. 20, 3 ♂, Sept. 22, 2 ♂, Sept. 23, 1 ♂, Sept. 25, 2 ♂, Sept. 30, 6 ♂, Oct. 1, 3 ♂, Oct. 3, 7 ♂, Oct. 5, 1 ♂, Oct. 18, 1 ♂, Oct. 21, 1 ♂ (lt).

Limnephilus bipunctatus CURTIS, 1834 — Pilismarót, 1983, Oct. 11, 2 ♂ (lt); Pilisszentkereszt, Dobogókő, 1957, May 14, 1 ♀ (leg. MIHÁLYI).

Limnephilus extricatus MCLACHLAN, 1865 — Pilismarót, 1983, Sept. 2, 1 ♂, (lt).

Limnephilus flavicornis FABRICIUS, 1787 — Pilismarót, 1983, Sept. 2, 1 ♂, Sept. 14, 2 ♂, Sept. 15, 1 ♂, Sept. 17, 1 ♀, Sept. 25, 1 ♂, Oct. 10, 4 ♂, 1 ♀, 1984, Sept. 23, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, Sept. 29—30, 1 ♂ (A).

Limnephilus griseus LINNAEUS, 1758 — Pilismarót, 1983, Sept. 5, 1 ♀, Sept. 6, 1 ♂, Sept. 16, 1 ♀, Oct. 2, 1 ♂, Oct. 3, 1 ♂, Oct. 7, 1 ♂, Oct. 8, 1 ♂, Oct. 11, 3 ♂, Oct. 13, 1 ♂, Oct. 19, 1 ♂, 1984, May 29, 1 ♂, Oct. 13, 1 ♂ (lt); Pilisszentkereszt, Dobogókő, 1957, May 14, 2 ♂ (leg. MIHÁLYI).

Limnephilus hirsutus PICTET,, 1834 — Pilismarót, 1986, Aug. 29, 1 ♂ (lt).

Limnephilus ignavus MCLACHLAN, 1865 — Pilismarót, 1983, Sept. 5, 1 ♂, Sept. 9, 1 ♀, Sept. 21, 1 ♂, Sept. 30, 1 ♂, Oct. 6, 1 ♂, Oct. 17, 1 ♂, 1984, Sept. 23, 1 ♀, Oct. 1, 1 ♂ (lt).

Limnephilus lunatus CURTIS, 1834 — Piliscsaba, 1983, Aug. 23, 1 ♀ (leg. SZABÓKY); Pilismarót, 1983, Sept. 6, 1 ♂, Sept. 9, 1 ♂, Sept. 14, 1 ♀, Sept. 17, 1 ♀, Sept. 20, 1 ♂, Sept. 28, 1 ♀, Sept. 29, 3 ♂, 1 ♀, Sept. 30, 1 ♂, 2 ♀, Oct. 3, 2 ♀, Oct. 6, 1 ♂, Oct. 8, 1 ♂, Oct. 10, 1 ♂, 1 ♀, Oct. 11, 2 ♂, Oct. 17, 1 ♀, Oct. 26, 2 ♂, 1984, June 25, 1 ♀, Sept. 22, 1 ♂, Oct. 3, 2 ♂, Oct. 5, 1 ♂, 1986, June 9—10, 1 ♂, June 30, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 1 ♂ (A).

Limnephilus sparsus CURTIS, 1834 — Pilismarót, 1983, Sept. 17, 2 ♀, Sept. 19, 1 ♂, Sept. 21, 1 ♂, 1984, Sept. 23, 1 ♀, Sept. 30, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 1 ♂, Sept. 29—30, 1 ♂ (A).

Limnephilus vittatus FABRICIUS, 1798 — Pilismarót, 1983, Sept. 3, 1 ♂, Oct. 5, 1 ♂, Oct. 8, 1 ♂, 1 ♀, Oct. 9, 1 ♂, Oct. 11, 1 ♂, 1 ♀, Oct. 14, 1 ♂, Oct. 15, 1 ♂, Oct. 16, 1 ♀, Oct. 17, 1 ♂, Oct. 18, 3 ♂, 1984, Sept. 20, 1 ♀, 1986,Oct. 26, 1 ♂, Oct. 29, 1 ♂, Nov. 7, 1 ♂ (lt); Pilisszentkereszt, Dobogókő, 1957, May 14, 1 ♂ (leg. MIHÁLYI).

Grammotaulius nigropunctatus PETZIUS, 1783 — Esztergom, 1961, April 24, 1 ♀ (leg. BLATTNY); Leányfalu, 1960, May 28, 1 ♀ (leg. BENEDEK); Piliscsaba, 1986, May 6, 1 ♂ (leg. SZABÓKY); Pilismarót, 1983, Sept. 5, 1 ♂, Sept. 9, 1 ♂, Sept. 13, 1 ♀, Sept. 15, 1 ♂, Sept. 16, 3 ♂, Sept. 21, 1 ♂, Sept. 28, 1 ♀, Sept. 29, 1 ♂, Oct. 3, 1 ♂, 1984, July 16, 1 ♂, Aug. 8, 1 ♀, Sept. 20, 1 ♂, Sept. 21, 1 ♂, 2 ♀, Sept. 22, 1 ♂, Sept. 23, 2 ♂, 1986, June 9—10, 1 ♂ (lt); Pilisszentkereszt, Dobogókő, 1950, May 14, 1 ♀ (leg. MIHÁLYI); Pilisszentkereszt, Kétbükk-ny. 1959, May 10, 1 ♂ (leg. SZŐCS); Szentendre, Dömörkapu, 1986, Sept. 21—22, 2 ♂ (A); Visegrád, 1984, July 12—13, 1 ♀, July 16—17, 1 ♀ (A).

Glyphotaelius pellucidus RETZIUS, 1783 — Pilismarót, 1984, Sept. 20, 1 ♂, Sept. 30, 1 ♂ (lt).

Anabolia furcata BRAUER, 1857 — Dömös, Malom-p., 1984, Aug. 18, 1 ♂ (A); Pilismarót, 1983, Sept. 30, 1 ♂, Oct. 8, 1 ♂, 1984, Sept. 30, 1 ♂ (lt); Visegrád, 1984,Oct. 9—10, 12 ♂, Oct. 18—19, 4 ♂, 1985, Sept. 28—29, 6 ♂ (A).

Potamophylax nigricornis PICTET, 1834 — Pilismarót, 1984, June 14, 2 ♂, June 16, 1 ♂, June 17, 2 ♂, June 25, 1 ♂, June 27, 1 ♂, June 30, 1 ♂, July 6, 2 ♂, July 8, 2 ♂, July 15, 1 ♂, July 16, 1 ♂, July 18, 1 ♂, July 22, 1 ♂, Aug. 7, 1 ♂, , Aug. 10, 2 ♂, Aug. 11, 1 ♂, Aug. 15, 1 ♂, Aug. 16, 1 ♂, Aug. 18, 1 ♂, Aug. 25, 1 ♂, Aug. 30, 1 ♂, 1986, June 9—10, 1 ♂, June 30, 1 ♂, July 23, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 27—28, 1 ♂, June 16—17, 5 ♂, 1 ♀, June 19—20, 2 ♂, Aug. 21—22, 1 ♀, 1987, June 15—16, 1 ♂, 1 ♀ (A); Visegrád, 1985, June 1—7, 1 ♀ (A).

Potamophylax rotundipennis BRAUER, 1857 — Pilismarót, 1983, Sept. 4, 1 ♂, 1984, Aug. 14, 1 ♂, Aug. 15, 1 ♂, Aug. 16, 1 ♂, Aug. 18, 1 ♂, Aug. 26, 1 ♂, Aug. 15, 1 ♂, Aug. 16, 1 ♂, Aug. 18, 1 ♂, Aug. 26, 1 ♂, Aug. 31, 1 ♂, Sept. 17, 1 ♂ (lt).

Halesus digitatus SCHRANK, 1781— Pilismarót, 1983, Sept. 13—Oct. 27, 130 ♂, 28 ♀, 1984, Aug. 16—Oct. 21, 529 ♂, 67 ♀, 1986, Oct. 29, 1 ♂, Nov. 25, 1 ♂, 1 ♀ (lt); Szentendre, Dömörkapu, 1984, Oct. 18, 10 ♂, Nov. 12, 4 ♂, 1986, July 7—8, 1 ♀, July 29—30, 18 ♂, 9 ♀, Aug. 14—15, 12 ♂, 6 ♀, Aug. 21—22, 8 ♂, 6 ♀, Sept. 21—22, 36 ♂, 15 ♀, Oct. 7—8, 6 ♂ (A); Visegrád, 1984, July 16—17, 1 ♂, 1 ♀, Aug. 6—7, 5 ♂, 1 ♀, Aug. 16—17, 2 ♂, Sept. 4—5, 6 ♂, Sept. 5—6, 1 ♂, , Oct. 9—10, 11 ♂, 6 ♀, Oct. 18—19, 28 ♂, 2 ♀, Oct. 30—Nov. 2, 49 ♂, 1 ♀, 1985, Sept. 28—29, 10 ♂, 8 ♀ (A).

Stenophylax permistus MCLACHLAN, 1895 — Pilismarót, 1983, Sept. 17, 3 ♀, Sept. 19, 1 ♂, Sept. 20, 1 ♂, Sept. 21, 2 ♀, Sept. 25, 1 ♂, Sept. 26, 1 ♂, Sept. 27, 1 ♂, 1 ♀, Sept. 29, 1 ♂, Oct. 2, 1 ♂, 1 ♀, Oct. 3, 1 ♂, Oct. 10, 1 ♀, Oct. 11, 2 ♀, Oct. 30, 1 ♂, 1984, May 13, 1 ♂, May 14, 1 ♂, May 16, 1 ♀, May 29, 1 ♂, 1 ♀, May 30, 1 ♂, June 1, 1 ♂, 1 ♀, June 3, 2 ♂, 1 ♀, June 5, 1 ♂, June 13, 1 ♂, 1 ♀, June 20, 1 ♀, Sept. 19, 1 ♂, Sept. 20, 4 ♂, 4 ♀, Sept. 21, 5 ♂, 8 ♀, Sept. 22, 3 ♂, 1 ♀, Sept. 23, 6 ♂, 5 ♀, Sept. 24, 1 ♂, 1 ♀, Sept. 29, 1 ♀, Sept. 30, 1 ♀, Oct. 3, 2 ♀, Oct. 5, 1 ♂, 1986, May 20, 2 ♀, June 5—6, 1 ♀, June 24, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 21—22, 1 ♂ (A); Visegrád, 1985, June 1—7, 1 ♀ (A).

Stenophylax viber CURTIS, 1834 — Pilismarót, 1983, Oct. 8, 1 ♂, Oct. 14, 1 ♂, 1984, Sept. 17, 1 ♂, Oct. 5, 2 ♂, Oct. 13, 1 ♂ (lt).

Micropterna lateralis STEPHENS, 1837 — Pilismarót, 1984, June 22, 1 ♂, Aug. 8, 1 ♂ (lt).

Micropterna nycterobia MCLACHLAN, 1875 — Pilismarót, 1983, Sept. 26, 1 ♂, Sept. 30, 1 ♂, Oct. 3, 1 ♂, Oct. 5, 1 ♂, Oct. 7, 1 ♂, Oct. 8, 1 ♂, Oct. 13, 1 ♂, Oct. 14, 1 ♂, Oct. 27, 1 ♂, 1984, June 3, 3 ♀, June 7, 1 ♂, June 20, 2 ♂, June 21, 2 ♂, 1 ♀, June 25, 1 ♀, July 8, 1 ♀, July 11, 2 ♂, 4 ♀, July 12, 4 ♂, 1 ♀, July 16, 1 ♂, July 21, 1 ♂, Sept. 24, 1 ♂, Oct. 11, 1 ♂, Oct. 16, 1 ♀, 1986, June 9—10, 3 ♂, June 24, 1 ♀, June 28, 2 ♀, June 30, 2 ♀, July 2, 2 ♀, July 3, 1 ♀, July 8, 1 ♀, Nov. 3, 1 ♂, Nov. 6, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, June 16—17, 2 ♂, 1 ♀, June 19—20, 2 ♂, Sept. 29—30, 3 ♂ (A).

Micropterna sequax MCLACHLAN, 1875 — Pilismarót, 1983, Sept. 14, 1 ♂, Sept. 17, 1 ♂, Oct. 5, 1 ♂, 1984, Sept. 19, 1 ♂, Sept. 29, 1 ♂, Oct. 11, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, Sept. 21—22, 3 ♂ (A); Visegrád, 1984, Oct. 18—19, 1 ♀ (A).

Micropterna testacea GMELIN, 1789 — Pilismarót, 1984, Oct. 11, 1 ♂ (lt); Visegrád, 1984, Oct. 9—10, 1 ♂ (A).

Chaetopteryx fusca BRAUER, 1857 — Pilismarót, 1984, Oct. 15, 2 ♂, Oct. 16, 2 ♂, 918, 1 ♂, 919, 1 ♂, Oct. 21, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, Dec. 6, 2 ♂ (A); Visegrád, 1984, Oct. 9—10, 1 ♂, 2 ♀, Oct. 30, 7 ♂, Nov. 2, 1 ♂, 1 ♀ (A).

Goeridae

Goera pilosa FABRICIUS, 1775 — Szentendre, Dömörkapu, 1986, June 16—17, 8 ♂, 1 ♀, June 19—20, 2 ♂, 1987, June 15—16, 1 ♀ (A).

Lithax obscurus HAGEN, 1859 — Szentendre, Dömörkapu, 1986, May 21—22, 7 ♂, Sept. 21—22, 2 ♂ (A).

Silo pallipes FABRICIUS, 1781 — Pilismarót, 1984, June 13, 1 ♂ (lt); Szentendre, Dömörkapu, 1986, May 21—22, 10 ♂, 3 ♀, May 27—28, 4 ♂, 1 ♀, June 16—17, 45 ♂, 10 ♀, June 19—20, 3 ♂, 4 ♀, July 7—8, 5 ♂, 2 ♀, July 29—30, 1 ♂, Aug. 14—15, 1 ♂, 1 ♀, Sept. 21—22, 2 ♂, 1987, June 5—6, 1 ♂, June 6—7, 1 ♂, June 15—16, 18 ♂, 3 ♀, July 15—16, 9 ♂, 5 ♀ (A); Visegrád, 1985, June 1—7, 47 ♂, 29 ♀(A).

Lepidostomatidae

Crunoecia irrorata CURTIS, 1834 — Pilismarót, 1984, June 27, 1 ♂ (lt).

Leptoceridae

Athripsodes bilineatus LINNAEUS, 1758 — Dömös; Szentendre, Bükkös-p. (UJHELYI, 1974); Szentendre, Dömörkapu, 1986, June 19—20, 1 ♂, July 7—8, 4 ♂, 3 ♀, Aug. 14—15, 5 ♂, 1987, July 15—16, 7 ♂, 4 ♀ (A).

Athripsodes commutatus ROSTOCK, 1874 — Visegrád (PONGRÁCZ, 1914).

Ceraclea dissimilis STEPHENS, 1836 — Piliscsaba, 1983, Aug. 23, 2 ♂ (leg. SZABÓKY); Visegrád, 1984, July 16—17, 2 ♀ (A).

Ceraclea riparia ALBARDA, 1874 — Visegrád (UJHELYI, 1974).

Setodes punctatus FABRICIUS, 1793 — Visegrád (UJHELYI, 1974); Visegrád, 1984, July 12—13, 1 ♀, July 16—17, 1 ♀ (A).

Sericostomatidae

Sericostoma personatum KIRBY et SPENCE, 1862 — Szentendre, Dömörkapu, 1986, June 4—5, 1 ♂, June 16—17, 6 ♂, June 19—20, 3 ♂, 1987, June 2—3, 1 ♂ (A); Visegrád, 1985, June 1—7, 14 ♂, 1 ♀ (A).

Characterization of the Trichoptera fauna

The 59 species pointed out from the Pilis Mountains show medium rich caddisfly fauna. Many more species are known from some well investigated mountainous regions (Bükk, Mátra and Kőszeg Mountains) or from some diversified plain or hilly regions (Szőce, W. Hungary; Kisdobsza, Barcs nature preservation area, S. Hungary). From the Bükk Mountains KISS (1979) presented 89 species, from the Kőszeg Mountains NÓGRÁDI and UHERKOVICH (1989) listed 88 species. 84 species were collected at Szőce (NÓGRÁDI; 1989), 64 at Kisdobsza (NÓGRÁDI and UHERKOVICH, 1988) and 65 species were pointed out from the Barcs Juniper Woodland by NÓGRÁDI (1985b).

The fauna of our examined area isn't rich, comparing with the ones mentioned above. However the collecting activities were more intensive there — e.g. in the Bükk Mountains —, or the examination of fauna lasted for a lot of years. This area is relatively poor in waters. Permanent collections were carried out only at 3 localities (Pilismarót, Szentendre—Dömörkapu and Visegrád), mostly with light traps.

As it appears from the list of the material, only some specimens were deposited in large collections. The literature (see Introduction) mentions some species only. Thus the laying of the foundation of caddisfly fauna can be made only by the collecting and elaboration work of the authors. It is expected that further collections on other localities can enrich the fauna with 15—20 species. However the recent known 59 species can help us to conclude.

First of all the species occurring all over the Hungarian mountains are characteristic of the examined area: *Rhyacophila fasciata* HAG., *Rh. tristis* PICT., *Philopotamus montanus* DON., *Ph. variegatus* SCOP., *Plectrocnemia brevis* MCL., *P. conspersa* CURT., *Lithax obscurus* HAG., *Athripsodes bilineatus* L. etc. These are known from the well investigated mountains (Bükk, Mátra, Mecsek, Bakony, Kőszeg Mountains) and some of the from lower hilly regions (Vasi-hegyhát, Zselic Downs etc.) as well.

Further species live in stagnat waters or slowly running rivers and are distributed all over the country, on the Great Hungarian Plain, too (e.g. numerous limnophilids and hydropsichids). The leptocerids occurring in this area live in larger rivers (Danube) or in slow streams. Such species are *Ceraclea dissimilis* STEPH., *C. riparia* ALBD., *Setodes punctatus* FABR.

It is worth while presenting some rare or characteristic species. These are known insufficiently from Hungary and some one of the were pointed out in the last years.

Agapetus delicatulus MCL. Its first home data were given by NÓGRÁDI (1985a) from Szőce and Bükk Mountains. Later she mentioned it from Magyarszombatfa (NÓGRÁDI, 1985a), and then from Barcs (NÓGRÁDI, 1985b). Unpublished datum is from Bodrogszegi (Coll. Janus Pannonius Museum, Pécs) (Fig. 3).

Cheumatipsyche lepida PICT. It is a very rare species and was collected only at three localities earlier: in Zemplén Mountains along the Tolcsva Stream (OLÁH, 1964), in the valley „Nagyvölgy" of Bükk Mountains (KISS, 1987) and at Kőszeg (NÓGRÁDI and UHERKOVICH, 1989). An old specimen is deposited in the Natural History Museum, Budapest, from the examined area (Fig. 3).

Plectrocnemia brevis McL. First it was published from Hungary by OLÁH (1967) who found it at Jósvafő. Later UJHELYI (1974, 1975) presented it from four localities in Mátra Mountains. This species was collected several in the Mecsek Mountains (NÓGRÁDI, 1984b, 1987; NÓGRÁDI et al., 1985), in the Bakony Mountains, at Dudar (NÓGRÁDI and UHERKOVICH, 1985), in the Kőszeg Mountains (NÓGRÁDI and UHERKOVICH, 1989) and at Szőce (NÓGRÁDI, 1989). Its unpublished datum is from Magyarszombatfa (Fig. 4).

Tinodes rostocki McL. Its first Hungarian locality was given by OLÁH (1967) from the Zemplén Mountains. Later it was published from Mátrafüred (UJHELYI, 1974) and Kőszeg Mts (NÓGRÁDI and UHERKOVICH, 1989). It is a relatively frequent species in the Kőszeg Mountains and in the examined area.

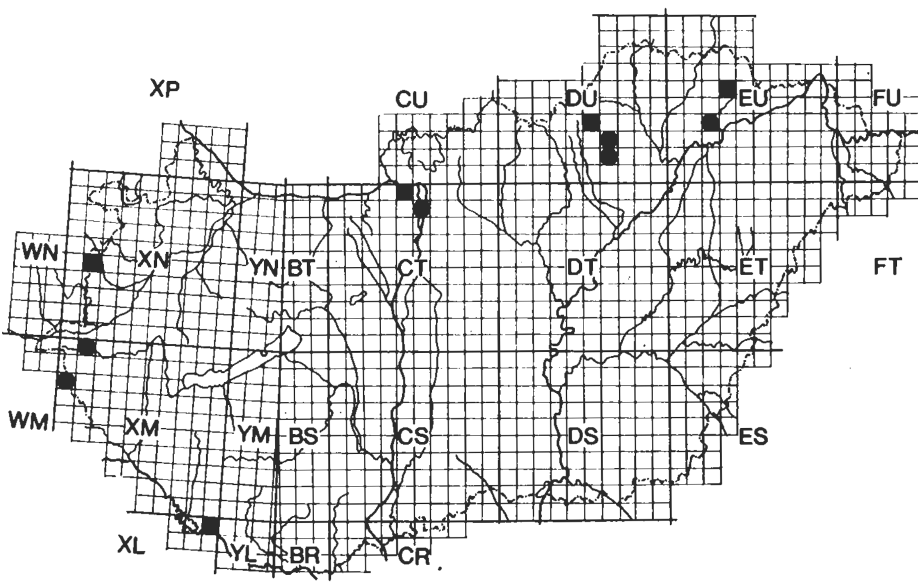


Fig. 3. Distribution of *Agapetus delicatulus* McL. (full circle) and *Cheumatopsyche lepida* PICT. (black square) in Hungary

Stenophylax vibex CURTIS. MALICKY (1980) has pointed out the invalidity of the name *Stenophylax speluncarum* McL., and instead he introduced *Stenophylax meridiorientalis* as a new name. In Hungary 3 species of *Stenophylax* genus live. *S. permistus* CURT. is a wide-spread species, it occurs on the Great Hungarian Plain, too. *S. meridiorientalis* McL. lives on Southern and Central Transdanubia, it is a pretty common species in the Mecsek Mountains (NÓGRÁDI, 1974b, 1987), and it occurs in the Zselic Downs and Bakony Mountains, too. The collection of Natural History Museum, Budapest, doesn't contain any authentic *S. vibex* specimens from Hungary. The literature mentions the occurrence of this species. The light trap operated at Pilismarót captured 4 males. During the elaboration of a large quantity of caddisfly material from the Northern Range of Middle Mountains (Északi Középhegység) further four localities of this species were found (Mátraszentistván, Mátrakeresztes, Bükk: Keskenyrét, Kisgyőr). The data of *S. meridiorientalis* MAL. published by UJHELYI (1985) may be erroneus. The two species, *S. vibex* and *S. meridiorientalis* can be mixed up. However their titilators, middle and upper appendages differ typically from each other (Fig. 5, 6).

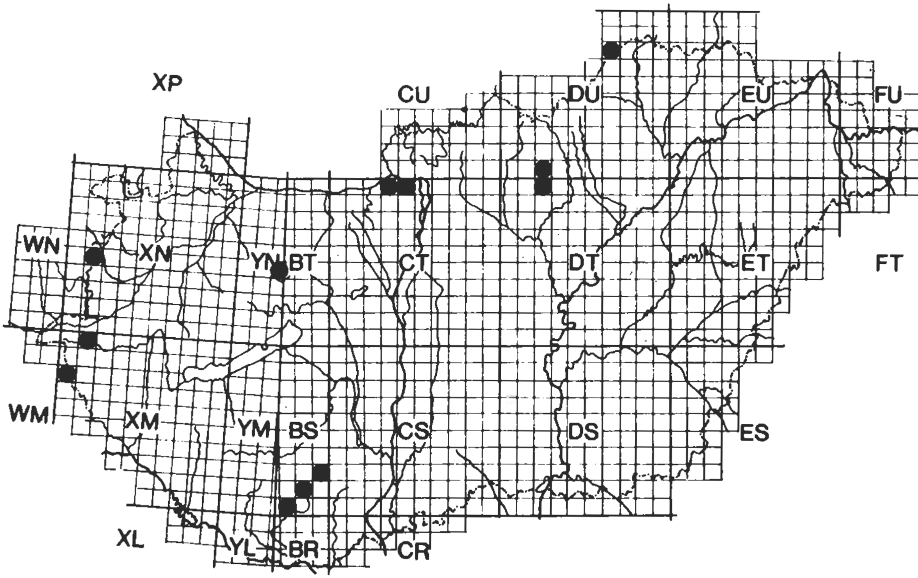


Fig. 4. Distribution of *Plectrocnemia brevis* McL. in Hungary

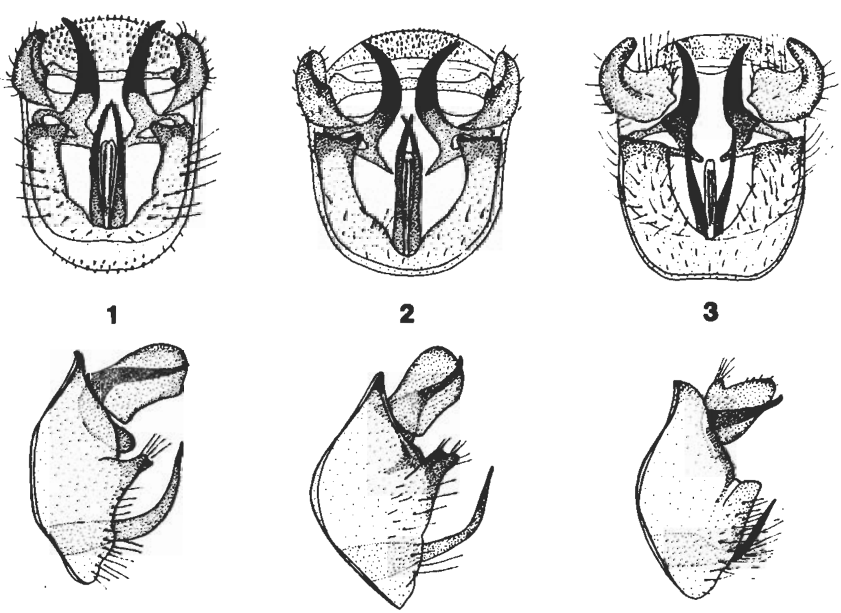


Fig. 5. Male genitals of three *Stenophylax* species caudal (upper row) and lateral (lower row.) 1=*S. meridiorientalis* McL. (Pécs, Deindol, 400 m, July 17, 1987, leg. A. Uherkovich, gen. prep. No. 1154), 2=*S. vibex* Curt. (Pilismarót, Oct. 5—6, 1984, light trap, gen. prep. No 1157), 3=*S. permistus* McL. (Pilismarót, Sept. 23, 1984, light trap. gen. prep. No. 1159)

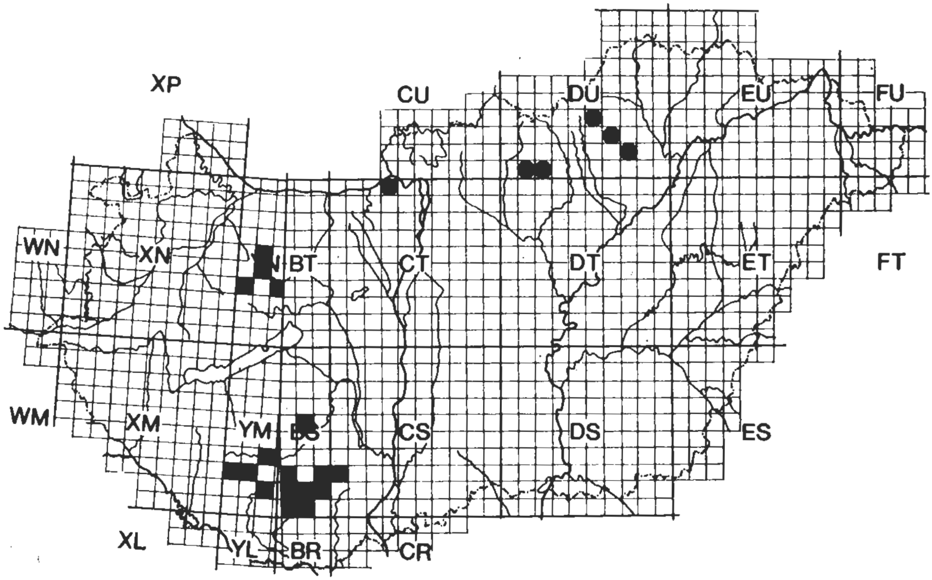


Fig. 6. Distribution of *Stenophylax vibex* McL. (full circle) and *Stenophylax meridiorientalis* McL. (black square) in Hungary

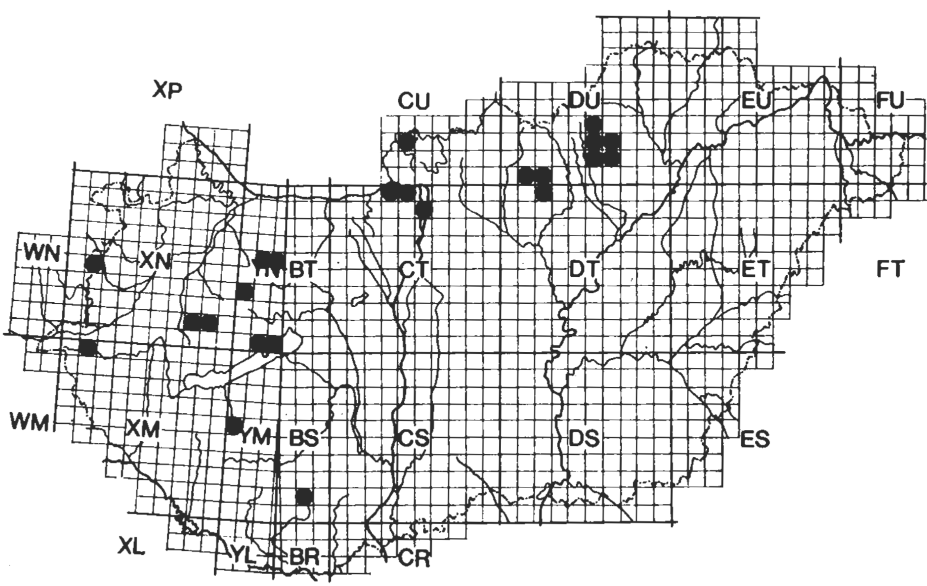


Fig. 7. Distribution of *Chaetopteryx fusca* BRAU. in Hungary

Chaetopteryx fusca BRAU. As it is a late autumn animal, its home distribution has became known in the last decades. It was collected at several localities in Bükk, Mátra and Bakony Mountains and in West Hungary: Kőszeg Mountains and Szőce. Further five sites are unpublished: Orfű, Osztopán (Southern Transdanubia), Káptalanfa (Bakony Mountains), Bernecebaráti (Börzsöny Mountains) and Parád (Mátra Mountains). It seems that this species is not rare along small streams of mountainous and hilly regions of Hungary (Fig. 7).

Crunoecia irrirata CURT. It lives in several sites in the Mátra, Bükk and Zemplén Mts., at Jósvafő, in Kőszeg Mountains and at Szőce (published data). It is very rare in Southern Transdanubia: in Mecsek Mountains (NÓGRÁDI, 1987). Sometimes it occurs along slow streams on the plains or in hilly regions: Magyarszombatfa, Bodrogszegi and Kaposfő (unpublished data).

Athripsodes commutatus ROSTOCK. The single locality of this leptocerid was published only by PONGRÁCZ (1914). As PONGRÁCZ's data were acceptable, we add this species to the list of our examined area and to the check list of Hungary also lack of voucher specimens. No further specimen were collected in the past decades, maybe it has extinced from Hungary.

Quantitative data

The examinations by the authors at three localities were all quantitative. The data are given in Table 1. 5519 specimens were derived from these collections.

The species have been ranged by their dominance. The most dominant ones — over 1 p. c. — are shown in Table 2—4. These tables denote the following characteristic features.

The undeterminated conglomerate of *Hydropsyche* females reach the most dominant figure at 3 of 3 sites, they are subdominant at the third site (Pilismarót). *Hydropsyche contubernalis* stands second and third, respectively. This caddisfly lives in very large mass in the Danube and it swarms in a broad (10—20 km) zone along it. Several species developing in the stream of examined area reach high value of dominance. This *Halesus digitatus* is the dominant species (every second specimens belong to this) at Pilismarót. *Hydropsyche instabilis, Rhyacophila fasciata, Stenophylax permistus, Hydropsyche saxonica, Silo pallipes, Plectrocnemia brevis* and other species are the members of the ecosystem of streams. They occur only along quick running and non-polluted streams. Some species can develop in slower and more polluted waters, but they did not generally reach high frequency (e.g. *Anabolia furcata, Limnephilus* species). The quantity of stagnant water species is negligible.

The activity of some frequent species of Pilismarót is given on graphs (Fig. 8). Four types of annual activity can be distinguished.

a) Spring and early summer species. Their swarming finishes in the middle of the summer. Such species is *Synagapetus mosely* (Fig. 7, 1), further *Rhyacophyla tristis* PICT., *Philopotamus montanus* DON., *Sericostoma personatum* K. et Sp.

b) Species with continuous activity. These species are on wing from spring to autumn without interruption. Such species are *Plectrocnemia* species, other polycentropodids, psychomyids, all *Hydropsyche, Rhyacophila fasciata* HAG., *Ecnomus tenellus* Ramb. and others.

c) Activity with summer interruption (aestivation). The specimens hatch the spring. They have a 1—3 months pause in their activity, during these summer months they are inactive. In the autumn months they are again on wing. Such species are *Limnephilus, Micropterna, Stenophylax* and other limnephilid species.

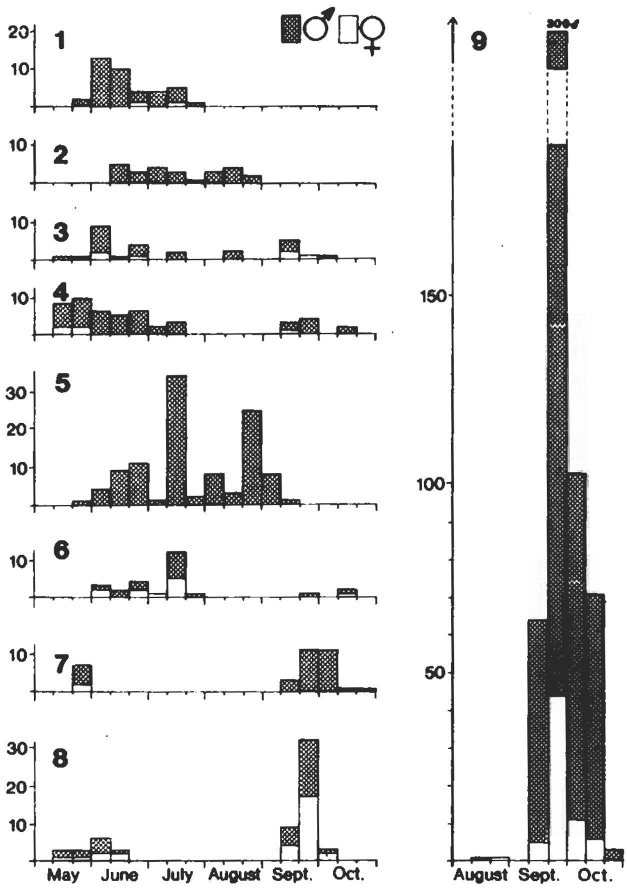


Fig. 8. Activity graph of some species at Pilismarót. 1=*Synagapetus mosely* ULMER, 2=*Potamophylax nigricornis* PICT., 3=*Plectrocnemia conspersa* CURT., 4=*Plectrocnemia brevis* MCL. 5=*Hydropsyche contubernalis* MCL., 6=*Micropterna nycterobia* MCL., 7=*Limnephilus auricula* CURT., 8=*Stenophylax permistus* MCL., 9=*Halesus digitatus* SCHRK.

d) Species with autumn activity. Some limnephilids are typical autumn ones. Their activity lasts 3—8 weeks in September—November (sometimes from August). Such species are *Ironoquia dubia* STEPH., *Anabolia furcata* BRAU., *Halesus digitatus* SCHRK., *Chaetopteryx fusca* BRAU. and *Potamophylax rotundipennis* BRAU.

*

This study was carried out in the framework of the UNESCO research program Pilis Biosphere Reserve with the coordination and support of the Institute of Ecology and Botany of the Hungarian Academy of Sciences.

Table 1. Quantitative data of the three most important collecting sites

Species	Visegrád	Szentendre, Dömörkapu	Pilismarót
Rhyacophila fasciata	97 ♂ 29 ♀	138 ♂ 19 ♀	6 ♂ 2 ♀
Rh. tristis	—	6 ♂ 1 ♀	—
Synagapetus mosely	74 ♂ 3 ♀	51 ♂ 21 ♀	47 ♂ 2 ♀
Agapetus delicatulus	—	5 ♀	—
Philopotamus montanus	1 ♂	6 ♂ 2 ♀	—
Ph. variegatus	4 ♂ 2 ♀	16 ♂ 2 ♀	—
Hydropsyche bulbifera	—	—	8 ♂
H. bulgaromanorum	2 ♂	—	—
H. contubernalis	166 ♂	184 ♂	265 ♂
H. fulvipes	15 ♂	4 ♂	2 ♂
H. instabilis	60 ♂	215 ♂	14 ♂
H. pellucidula	—	—	2 ♂
H. saxonica	49 ♂	142 ♂	1 ♂
H. sp. indet.	393 ♀	939 ♀	271 ♀
Neureclipsis bimaculata		1 ♂	—
Plectrocnemia brevis	1 ♂	—	50 ♂ 5 ♀
P. conspersa	3 ♂	29 ♂ 4 ♀	26 ♂ 6 ♀
Cyrnus trimaculatus	—	—	3 ♂ 4 ♀
Polycentropus flavomaculatus	15 ♂ 3 ♀	20 ♂ 2 ♀	—
Lype reducta	3 ♂	—	—
Tinodes rostocki	12 ♂	41 ♂ 11 ♀	1 ♀
Ecnomus tenellus	10 ♂ 77 ♀	4 ♂ 3 ♂	—
Ironoquia dubia	1 ♀	1 ♂	1 ♀
Ecclisopteryx madida	2 ♂	14 ♂ 12 ♀	1 ♀
Limnephilus affinis	—	2 ♂ 2 ♀	3 ♂ 20 ♀
L. auricula	—	—	101 ♂ 18 ♀
L. bipunctatus	—	—	2 ♂
L. extricatus	—	—	1 ♂
L. flavicornis	—	1 ♂	12 ♂ 2 ♀
L. griseus	—	—	14 ♂
L. hirsutus	—	—	1 ♂
L. ignavus	—	—	5 ♂ 2 ♀
L. lunatus	—	1 ♂	19 ♂ 13 ♀
L. sparsus	—	2 ♂	3 ♂ 3 ♀
L. vittatus	—	—	15 ♂ 3 ♀
Anabolia furcata	22 ♂ 2 ♀	—	3 ♂
Grammotaulius nigropunctatus	—	2 ♂	17 ♂ 5 ♀
Glyphotaelius pellucidus	—	—	2 ♂
Potamophylax nigricornis	1 ♀	9 ♂ 3 ♀	28 ♂
P. rotundipennis	—	—	9 ♂
Halesus digitatus	128 ♂ 23 ♂	119 ♂ 45 ♀	662 ♂ 96 ♀
Stenophylax permistus	1 ♀	1 ♂	40 ♂ 43 ♀
S. vibex	—	—	6 ♂
Micropterna lateralis	—	—	2 ♂
M. nycterobia	—	6 ♂ 1 ♀	30 ♂ 20 ♀
M. sequax	1 ♀	3 ♂	6 ♂
M. testacea	1 ♂	—	1 ♂
Chaetopteryx fusca	9 ♂ 3 ♀	2 ♂	7 ♂
Crunoecia irrorata	—	—	1 ♂
Goera pilosa	—	10 ♂ 2 ♀	—
Lithax obscurus	—	9 ♂	—
Silo pallipes	47 ♂ 29 ♀	100 ♂ 29 ♀	1 ♂
Athripsodes bilineatus	—	17 ♂ 7 ♀	—
Ceraclea dissimilis	2 ♀	—	—
Setodes punctatus	2 ♀	—	—
Sericostoma personatum	14 ♂ 1 ♀	11 ♂	—
Altogether	736 ♂ 573 ♀	1167 ♂ 1110 ♀	1415 ♂ 518 ♀
Total	5519 caddisflies		

Table 2. Dominant species at Visegrád, Stream „Apátkúti-patak"

Species	Specimen	p. c.
Hydropsyche sp. indet.	393	30.02
H. contubernalis	166	12.68
Halesus digitatus	151	11.53
Rhyacophila fasciata	126	9.63
Ecnomus tenellus	87	6.65
Synagapetus mosely	77	5.88
Silo pallipes	76	5.81
Hydropsyche instabilis	60	4.58
Hydropsyche saxonica	49	3.74
Anabolia furcata	22	1.68
Polycentropus flavomaculatus	18	1.38
Sericostoma personatum	15	1.15
Hydropsyche fulvipes	15	1.15

Table 3. Dominant species at Szentendre, Stream „Bükkös-patak" (Dömörkapu)

Species	Specimen	p. c.
Hydropsyche sp. indet.	939	41.24
Hydropsyche instabilis	215	9.44
Hydropsyche contubernalis	184	8.08
Halesus digitatus	164	7.20
Rhyacophila fasciata	157	6.90
Hydropsyche saxonica	142	6.42
Silo pallipes	129	5.66
Synagapetus mosely	72	3.16
Tinodes rostocki	52	2.28
Plectrocnemia conspersa	33	1.45
Ecclisopteryx madida	26	1.14
Athripsodes bilineatus	24	1.05

*Table 4. Dominant species at Pilismarót, 1984**

Species	Specimen	p. c.
Halesus digitatus	595	49.83
Hydropsyche sp. indet.	131	10.96
Hydropsyche contubernalis	107	8.95
Stenophylax permistus	60	5.02
Plectrocnemia brevis	42	4.01
Synagapetus mosely	38	3.18
Limnephilus auricula	35	2.93
Plectrocnemia conspersa	27	2.26
Micropterna nycterobia	26	2.17
Potamophylax nigricornis	25	2.09
Limnephilus affinis	14	1.17

* The specimens captured in 1983 and 1986 were not taken into account because the collections of those years were not regular all over the year.

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